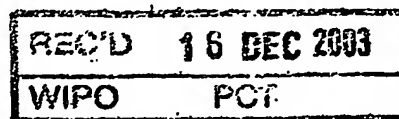




10/529105 #2
PCT/US03/30499
Rec'd CT/PTO 25 MAR 2003



Patent Office
Canberra

I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 20002951782 for a patent by FERNO AUSTRALIA PTY LTD as filed on 26 September 2002.



WITNESS my hand this
Twenty-eighth day of November 2003

A handwritten signature in dark ink, appearing to be "L. Mynott".

LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
AND SALES

**PRIORITY
DOCUMENT**

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

AUSTRALIA
Patents Act 1990

PROVISIONAL SPECIFICATION

Name of Applicant: Ferno Australia Pty Ltd

Address for Service: CULLEN & CO
Patent & Trade Mark Attorneys,
239 George Street
Brisbane Qld 4000
Australia

Invention Title: Roll-in Cot

This invention is described in the following statement:

ROLL-IN COT

The present invention relates to emergency cots, such as of the type used to transport patients. In particular, the present invention relates to roll-in cots having collapsible legs, of the type used in emergency vehicles
5 such as ambulances.

Emergency cots of the roll-in type are used to support a patient on a stretcher, the stretcher being mounted on a wheeled undercarriage or transporter. A patient may be manoeuvred on an emergency cot by a single operator at the trailing end or maybe manoeuvred with the assistance of other
10 operators on the wheeled transporter.

Emergency cots of the roll-in type are configured to be able to be rolled into various types of rescue vehicles, such as ambulances, vans, station wagons, modular type rescue vehicles, aircrafts, helicopters and the like. In order to be able to roll an emergency cot into such a vehicle, the cot
15 generally is configured to support the stretcher at a similar height to that of the platform in the emergency vehicle upon which the patient is to be transported. The undercarriage or transporter collapses to be beneath the stretcher and is supported on the platform.

During the loading of a patient onto a platform in an emergency
20 vehicle the wheel transporter or undercarriage needs to be collapsed. As the wheeled transporter collapses, the operator is required to support the weight of the patient and the emergency cot and push the emergency cot onto the platform. In order to facilitate the loading of a patient onto such a platform, the wheeled trolley generally has a pair of rollers at its leading end that are
25 positioned at the height of the platform such that the leading wheels engage the platform prior to the collapse of the wheeled trolley. Thus the leading end of the emergency cot is supported on the platform and the operator supports the rear of the emergency cot.

Once the leading end of the emergency cot is supported on the
30 platform, the operator will typically activate a handle causing part or all of the wheeled transporter to collapse. Typically the wheeled transporter will have a leading pair of collapsible legs and a trailing pair of collapsible legs in many configurations of emergency cots both the leading and trailing pairs of

collapsible legs are activated by a single handle and the operator is required to support the rear of the emergency cot. In other configurations separate handles have been provided for the leading pair of collapsible legs and the trailing pair of collapsible legs respectively. The provision of separate
5 handles for activation of the leading and trailing pairs of collapsible legs respectively allows the leading pair of collapsible legs to be activated initially and the emergency cot pushed further onto the platform and be supported on wheels at an intermediate position prior to the activation of the trailing pair of collapsible legs. In this manner, the operator is required to support a lesser
10 weight as more of the weight of the cot and patient is supported on the platform and the moment of force is also reduced. The moment of force depends on whether the stretcher is fitted with additional sets of wheels near the centre of the stretcher. On a stretcher with only front wheels the moment stays the same because the distance between the front wheels and the
15 operator is the same no matter how far the stretcher is into the vehicle. Irrespective of the weight borne by the operator, the length of time the operator has to bear the weight is reduced if the rear wheels are collapsed at the last possible time. However, the added complexity in operating the respective handles in sequence during the loading of a patient into an
20 emergency vehicle is often cumbersome and may result in the respective handles being operated out of sequence thereby causing the operator to have to unexpectedly support the weight of the patient and the emergency cot.

We have now found an emergency cot that enables simplified operation of the respective leading and trailing pairs of collapsible legs in the
25 desired sequence or which overcomes or ameliorates one or more of the disadvantages described above, or which at least provides the consumer with a useful or commercial choice.

In one broad form the present invention provides a roll-in cot having a patient support attached to a wheeled transporter wherein the
30 wheeled transporter comprises leading and trailing pairs of collapsible legs having respective proximal ends pivotally connected to a frame and distal ends including wheels wherein the trailing pair of collapsible legs is operable from a locked condition by a release assembly comprising a handle

connected to a pawl, wherein in an activated condition the pawl abuts a stop, said stop is connected to a touch bar disposed in front of the trailing pair of collapsible legs whereby engagement of the touch bar against platform withdraws the stop from abutment with the pawl and releases the trailing pair of collapsible legs.

5 The roll-in cot of the first broad form of the present invention allows the operator to activate the handle for collapsing the trailing pair of collapsible legs without the legs collapsing until a touch bar associated with the trailing pair of collapsible legs engages a platform. In this manner
10 unintentional or early operation of the handle will not result in the operator having to bear the weight of the patient and the emergency cot until the emergency cot is positioned where the touch bar engages the platform.

The patient support used in the roll-in cot of the present invention may be in any convenient form. Suitably, the patient support may
15 be in the form of a stretcher. However, it will be appreciated that other patient support configurations may be used such as chairs or the like. It is preferred that the patient support be in the form of a segmented stretcher whereby respective segments may be contoured to provide improved support for the patient.

20 The patient support may be removably attached to the wheeled transporter. The patient support may be a detachable stretcher that may be reversibly attached to the frame of the wheeled transporter. However, it is within the scope of the present invention for the patient support to be permanently affixed to the wheeled transporter.

25 The wheeled transporter includes a frame on which the patient support is mounted and to which the leading and trailing pairs of collapsible legs are pivotally connected. The frame may be of any convenient configuration and may preferably be adjustable in height such that the roll-in cot may be readily loaded into an emergency vehicle. The frame may also
30 include provision for the attachment of medical appliances thereto that may be associated with patient transport. For example, the frame may include a receptacle for holding an oxygen cylinder or heart monitoring equipment.

The leading and trailing pairs of collapsible legs are pivotally

connected to the frame. It is preferred that the respective pairs of collapsible legs be connected to the frame through a hinge that extends the width of the frame and through the proximal end of the respective pairs of collapsible legs.

It is preferred that the respective pairs of collapsible legs be provided with
5 bracing members that extend there between to stabilise the respective pairs of collapsible legs. The respective pairs of collapsible legs may be splayed, i.e. that the leading pair of collapsible legs be angled forward and the trailing pair of collapsible legs be angled backwards. A strut may extend from the respective pairs of collapsible legs, which strut may engage the frame thereby
10 retaining the collapsible legs in a locked condition. Vertical legs may also be used at the distal end of the collapsible legs wheels are provided so as to enable the roll-in cot to be readily manoeuvred by a single operator. The wheels may be rotatably mounted on the distal ends of the collapsible legs so as to form casters or the like. Rotatably mounted wheels may be selectively
15 locked, preferably in line with the roll-in cot so that the roll-in cot may be pushed in a straight line.

The trailing pair of collapsible legs is operable from a locked condition by a release assembly. In a preferred configuration the release assembly may releasably engage a rearwardly extending strut to as to allow
20 the trailing pair of collapsible legs to be pivoted towards the frame.

The release assembly comprises a handle connected to a pawl. Preferably the handle is located at the trailing end of the frame such that an operator manoeuvring the roll-in cot may readily access the handle from a position rearward of the roll-in cot. The pawl may be disposed at any
25 convenient location on the frame. Preferably the pawl may be directly connected to the handle. Activation of the handle moves the pawl into abutment with a stop. It is preferred that in the inactivated condition the pawl is retained in a locked condition against a fixed detent whereby any accidental movement of the touch bar will not permit the trailing pair of collapsible legs to
30 collapse.

In an activated condition the pawl abuts the stop. The stop is connected to a touch bar disposed in front of the trailing pair of collapsible legs. Movement of the roll-in cot towards the platform, such as may be

disposed on an emergency vehicle, causes the touch bar to engage the platform and withdraw the stop from abutment with the pawl and permit the trailing pair of collapsible legs to collapse. The touch bar may preferably engage a rear bumper bar of an ambulance or any other convenient part of the platform.

5 In a preferred embodiment of the present invention the pawl is in the form of a cam follower and the stop is part of a camming surface against which the cam follower moves. In the activated condition the cam follower is prevented from moving to a position where the trailing pair of collapsible legs may be released by the orientation of the camming surface.

10 The touch bar is connected to the camming surface and on engagement with the platform causes the camming surface to be rotated thereby permitting the cam follower to move to a position where the collapsible legs are released.

In a further preferred configuration the leading pair of collapsible legs may be released by the operation of the handle whereby the pawl is moved to an activated condition. In this way a single handle may be used to selectively operate the leading pair of collapsible legs and the trailing pair of collapsible legs. In a preferred form the handle extends from a bar mounted on the frame by a pair of opposed arms. The pair of opposed arms are pivotably mounted on the frame and the bar respectively such that longitudinal movement of the bar relative to the frame by operation of the handle causes the bar to move laterally with respect to the frame. As the handle is moved to an activated condition a pawl fixedly mounted on the bar engages a camming surface and is restricted in lateral movement. In the activated condition the bar is moved to an intermediate lateral position. A pin or other release mechanism for the leading pair of collapsible legs is operated by the movement of the bar to the intermediate lateral position and the leading pair of collapsible legs released. In the intermediate lateral position the release mechanism, such as a pin, for the trailing pair of collapsible legs is retained in a locked condition. Upon engagement of the touch bar with the platform the camming surface is rotated, thereby allowing the cam follower or pawl to move further laterally relative to the frame and release the trailing pair of collapsible legs.

15

20

25

30

It is preferred that loading wheels be mounted on the frame and the collapsible legs to facilitate the loading of the roll-in cot onto the platform, such as in the rear of an ambulance. Loading wheels are preferably provided at the leading end of the frame at a height that allows ready engagement on the platform. Loading wheels are also preferably provided on the leading side of the leading pair of collapsible legs as well as the leading side of the trailing pair of collapsible legs. Loading wheels may also be mounted on the underside of the main frame at one or more predetermined positions. It is preferred that in the collapsed position all of the loading wheels are substantially aligned so as to sit flatly on the platform. The roll-in cot may include a locking assembly to retain it in position on the platform.

The undercarriage of the roll-in cot of the present invention may find use in other applications as will be apparent to the skilled addressee.

In order that the invention may be more fully understood and put into practice, preferred embodiments thereof will now be described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a wheeled transporter according to one embodiment of the present invention.

Figure 2 is a side view of the roll-in cot of Figure 1 in a first position.

Figure 3 is a side view of the roll-in cot of Figure 2 in a second position.

Figure 4 is a side view of the roll-in cot of Figure 2 in a third position.

Figure 5 is a side view of the roll-in cot of Figure 2 in a fourth position.

Figure 6 is a side view of the roll-in cot of Figure 2 in a fifth position.

Figure 7 is a side view of the roll-in cot of Figure 2 in a sixth position.

Figure 8 is a side view of a roll-in cot in a first position. Figure 9 is a side view of the roll-in cot of Figure 8 in a second position.

Figure 9 is a side view of the roll-in cot of Figure 8 in a second position.

Figure 10 is a side view of the roll-in cot of Figure 8 in a third position.

5 Figure 11 is a side view of the roll-in cot of Figure 8 in a fourth position.

Figure 12 is a side view of the roll-in cot of Figure 8 in a fifth position.

10 Figure 13 is a side view of the roll-in cot of Figure 8 in a sixth position.

Figure 1 shows a roll-in cot 1 with the stretcher or patient support removed for the sake of clarity. The roll-in cot is formed from a frame 2 on which are pivotally mounted a leading pair of collapsible legs 3 and a trailing pair of collapsible legs 4. In the elevated condition shown, the roll-in cot 1 is supported on the leading pair of collapsible legs 3 and trailing pair of collapsible legs 4. The leading pair of collapsible legs 3 is locked into position by a support strut 5 that is locked to the frame 2. The trailing pair of collapsible legs is locked in position by a support strut 6 locked to the frame 2. A release assembly 7 is operated by a handle 8 that actuates a bar 9 by moving the bar 9 rearwardly relative to the roll-in cot 1.

On operation of the handle 8 so as to move the bar 9 in a rearward direction bar 9 is displaced laterally by arms 10 that are pivotally mounted to both the frame and to bar 9. Operation of the release mechanism will be described in further detail with reference to Figures 2 to 7.

25 The release assembly also includes a touch bar 11 for engagement with the rear of a platform. Actuation of touch bar 11 causes a cam 12 to be rotated on the frame 2. Rotation of the cam 12 on frame 2 allows the bar 9 to move further in a lateral direction.

30 In the collapsed position the frame has loading wheels 13 located on the frame 2 as well as on the leading space of the leading pair of collapsible legs 3 and the trailing pair of collapsible legs 4.

Figure 2 shows the roll-in cot 1 engaging the rear of an emergency vehicle 15 such as an ambulance. The loading wheels 13 that

are disposed on the front of the frame 2 engage in emergency vehicle 15. In the first position the handle is shown in Figure 2 in a neutral position as is the bar 9 and the cam 12. A pawl 14 is mounted on the bar 9 so as to cooperate with the camming surface 20 of the cam 12.

5 In a second position shown in Figure 3 the loading wheels 13 positioned at the front of frame 2 are further advanced onto the emergency vehicle 15. The handle 8 is moved to an activated position and the bar 9 is moved laterally relative to frame 2 by the rotation of arm 10 relative to the frame 2 and the bar 9. In the activated condition pawl 14 is moved rearwardly
10 with respect to the frame 2 and engages a stop on the camming surface 20 in this activated condition support strut 5 is slideably released from fixed engagement with the frame 2, thereby allowing the leading pair of collapsible legs 3 to rotate relative to the frame 2. The loading wheels 13 that are disposed on the leading pair of collapsible legs 3 are then able to engage the
15 emergency vehicle 15 so as to assist in supporting the roll-in cot 1.

Figure 4 shows the roll-in cot 1 in a third position with the loading wheels 13 further advanced on the emergency vehicle 15. The position of the handle 8 and the cam 12 are the same as that shown in Figure 3.

20 In Figure 5 the touch bar 11 has engaged the emergency vehicle 15. Operation of the touch bar 11 activates a push rod 22 and causes the cam 12 to rotate relative to frame 2 about pivot 21. Rotation of cam 12 releases the pawl 14 from the stop on the camming surface 20 thereby slideably releasing support strap 6 from locking engagement with the frame 2.

25 Figure 7 shows the roll-in cot 1 fully advanced onto the emergency vehicle 15 with the loading wheels 13 positioned on the trailing pair of collapsible legs advanced onto the emergency vehicle 15.

30 Figure 8 shows a roll-in cot 30 having a leading pair of collapsible legs 33 and a trailing pair of collapsible legs 34. The respective pairs of collapsible legs 33, 34 are rotatably mounted on frame 32. Figure 8 shows a leading loading wheel 35 engaged to an emergency vehicle 36. The handle 37 for the release of the leading pair of collapsible legs 33 and the

primary lock 52 on the trailing pair of collapsible legs 34 and handle 38 for the manual release of the secondary lock 53 are in the neutral positions as are bars 39 and 40 respectively.

Figure 9 shows the roll-in cot 30 in a second position with the leading pair of collapsible legs 33 partially collapsed. The handle 37 has been moved to an activated condition whereby the bar 39 has advanced rearwardly relative to frame 32. By arm 41 pivotably mounted to frame 32 and to bar 39 the bar 39 is urged laterally causing support strut 42 to be slideably released from fixed engagement with the frame 32, thereby allowing the leading pair of collapsible legs 33 to rotate relative to the frame 32. The lateral movement of bar 39 also causes the primary lock 52 on the trailing pair of collapsible legs 34 to be released. At this stage the trailing pair of collapsible legs 34 are still secured to frame 32 by secondary lock 53. Figure 10 shows the roll-in cot 30 further advanced onto the emergency vehicle 36.

Figure 11 shows touch bar 51 in engagement with the emergency vehicle 36. Activation of touch bar 51 causes the secondary lock 53 on the trailing pair of collapsible legs 34 to be released. Operation of handle 38 is not required during loading of the roll-in cot. It is used in situations where the height of the cot with stretcher attached is used to assist in loading a patient onto the stretcher.

Figure 12 shows the trailing pair of collapsible legs released. Figure 13 shows the roll-in cot 30 fully loaded onto the emergency vehicle 36.

Persons skilled in the art will appreciate that the invention described above may be subject to improvements and modifications that will be apparent without departing from the spirit and scope of the invention described herein.

DATED this 26th day September 2002

FERNO AUSTRALIA PTY LTD

By their Patent Attorneys

CULLEN & CO.

FIG 1.

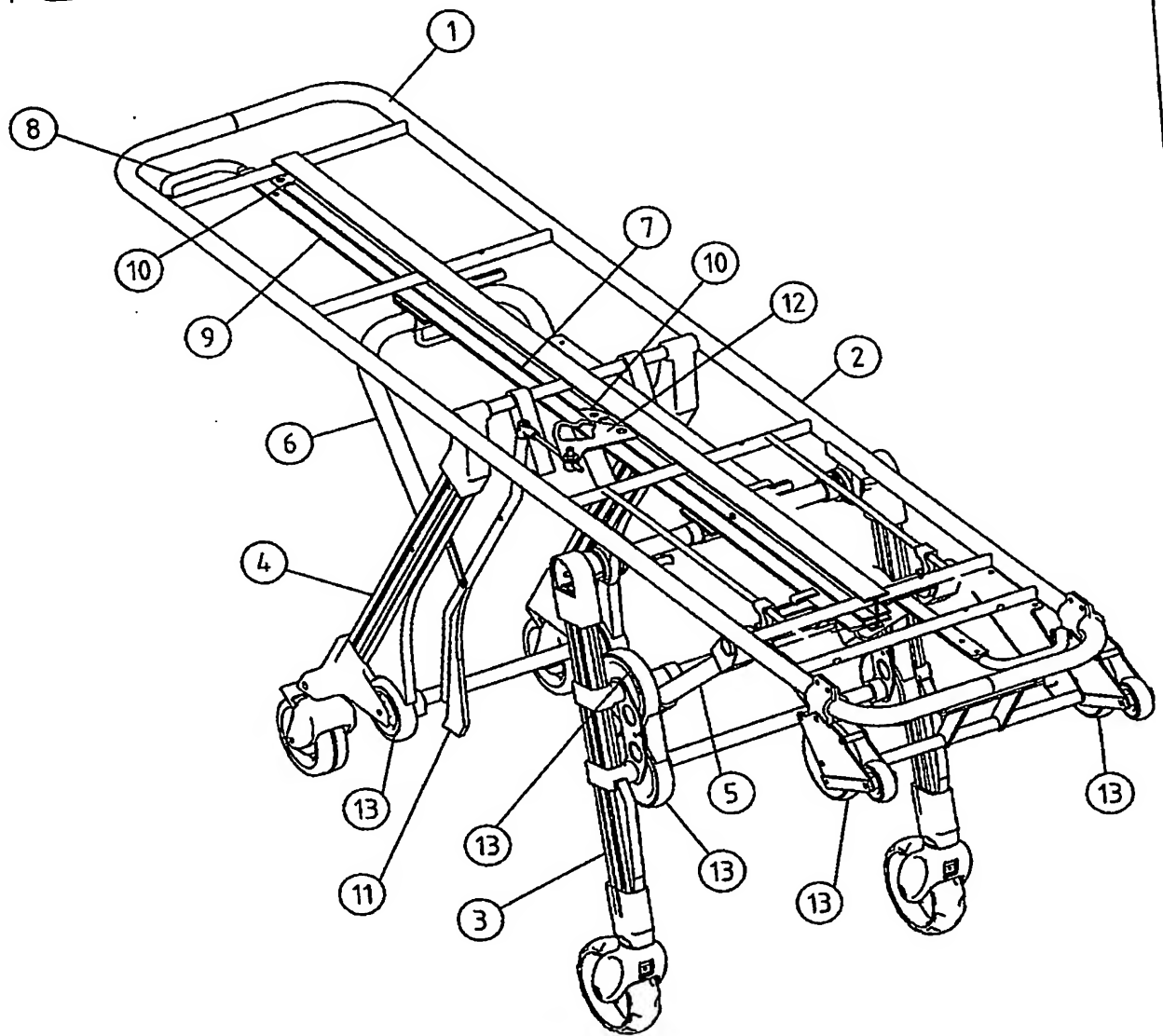


FIG 2.

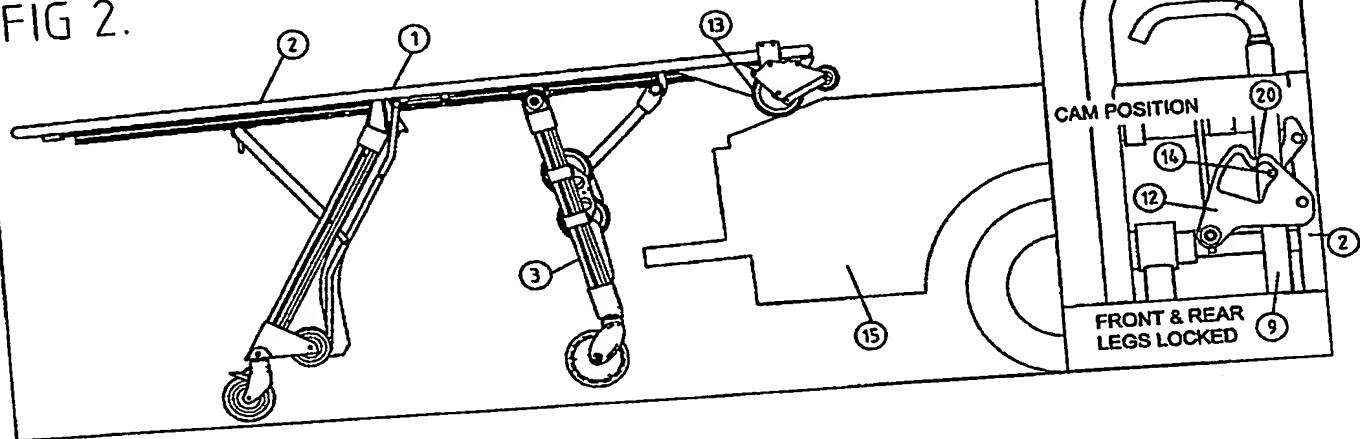


FIG 3.

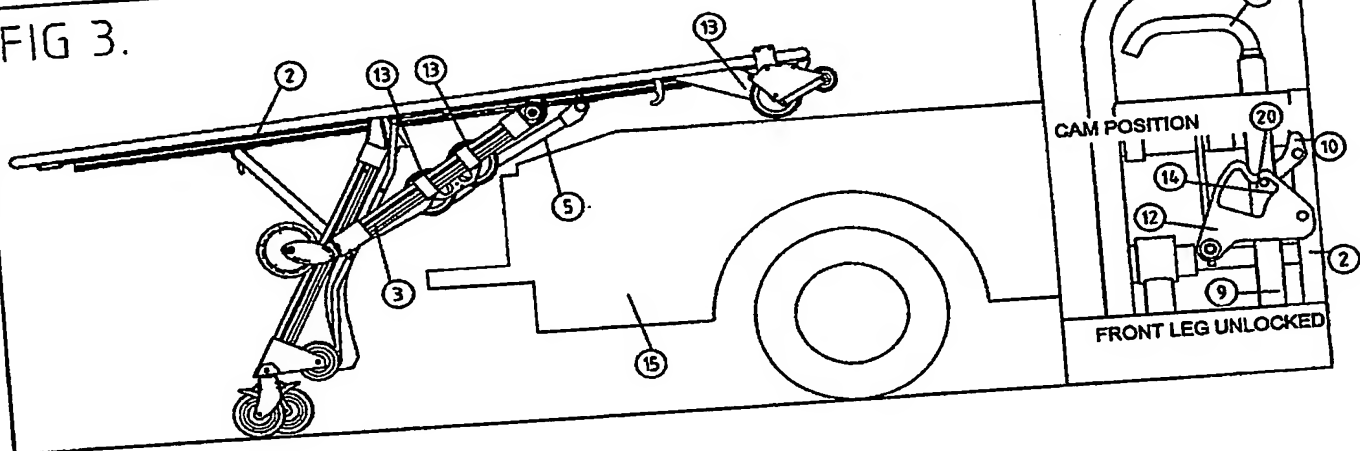


FIG 4.

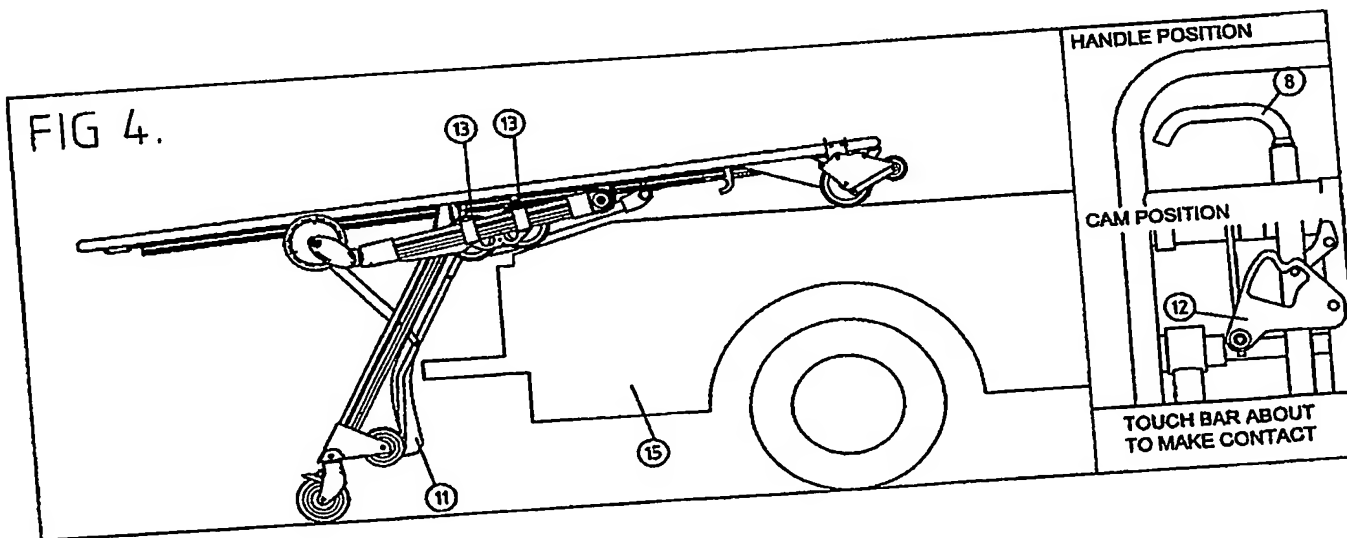
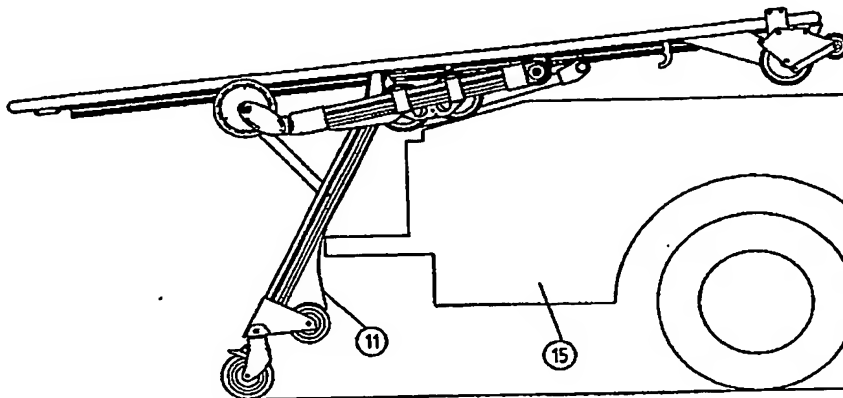


FIG 5.

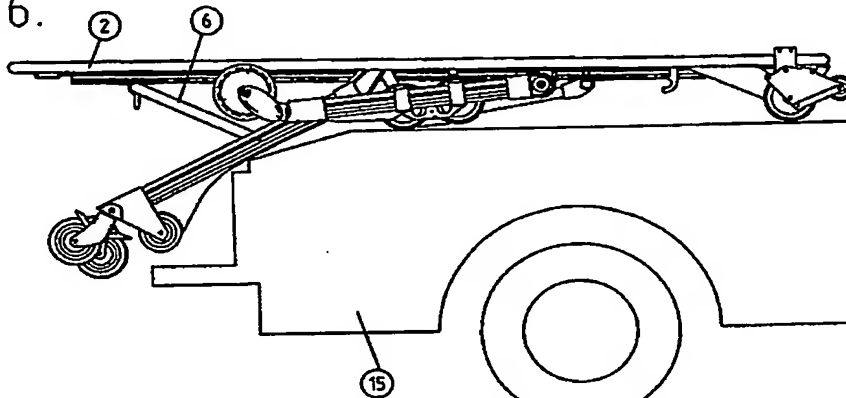


HANDLE POSITION

CAM POSITION

TOUCH BAR PUSHED IN - FREES HANDLE

FIG 6.

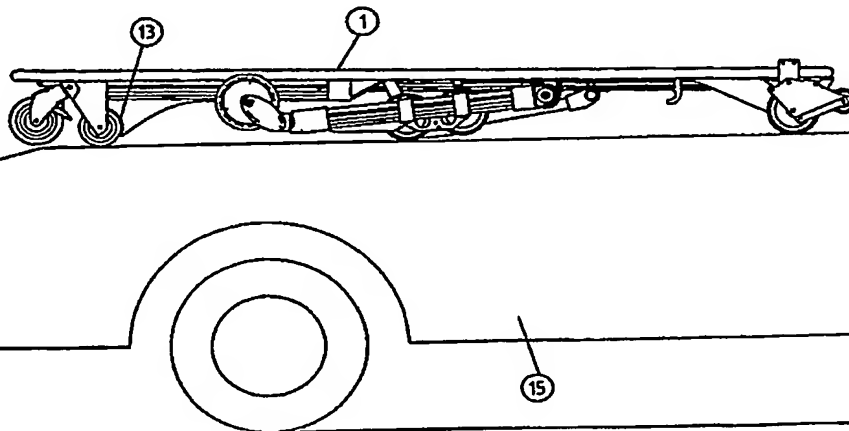


HANDLE POSITION

CAM POSITION

REAR LEGS UNLOCKED

FIG 7.



HANDLE POSITION

CAM POSITION

HANDLE RELEASED

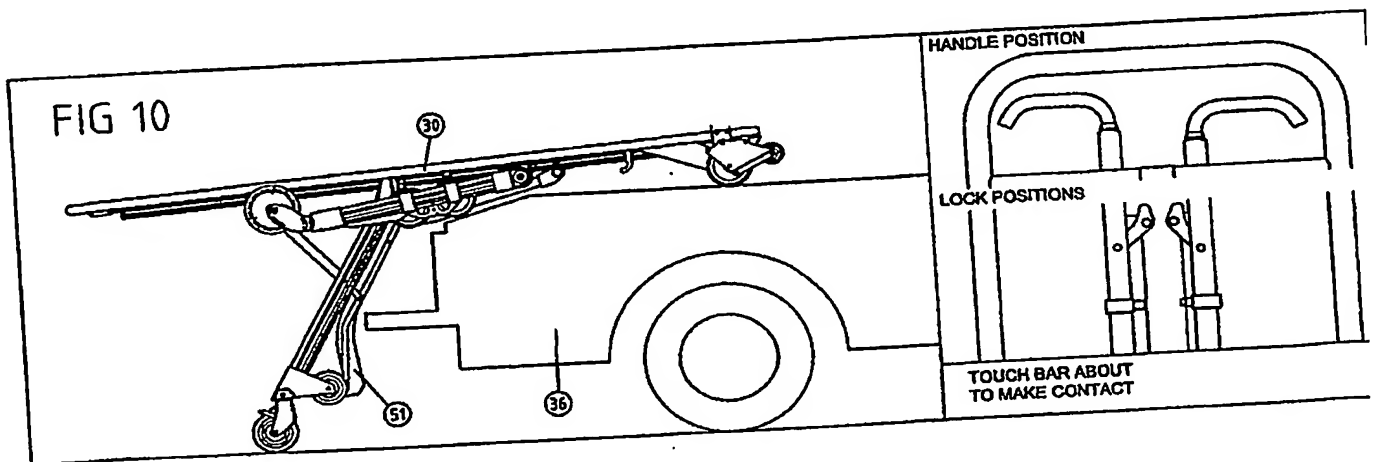
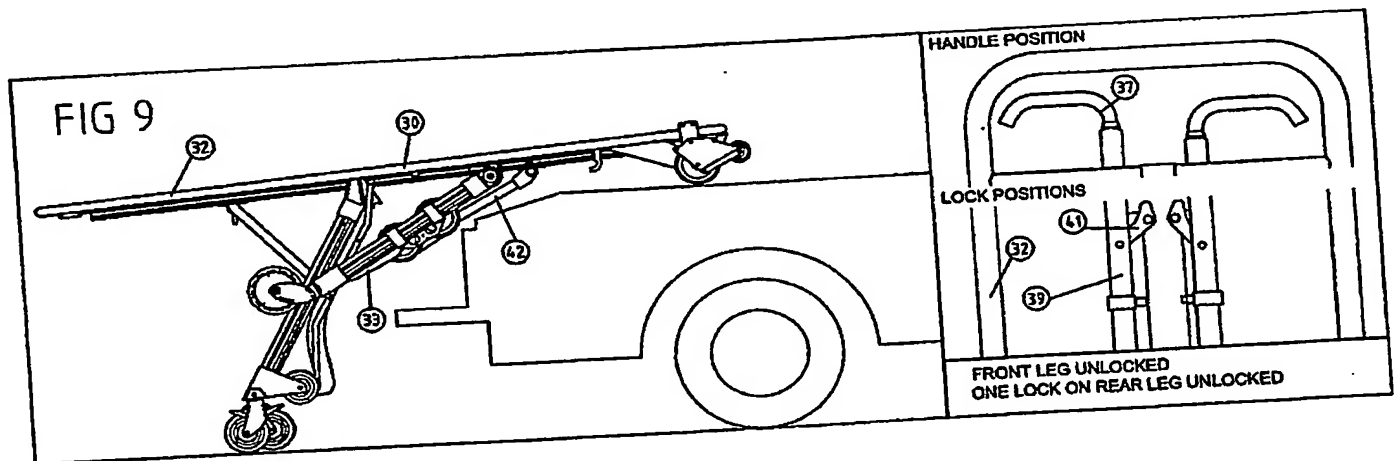
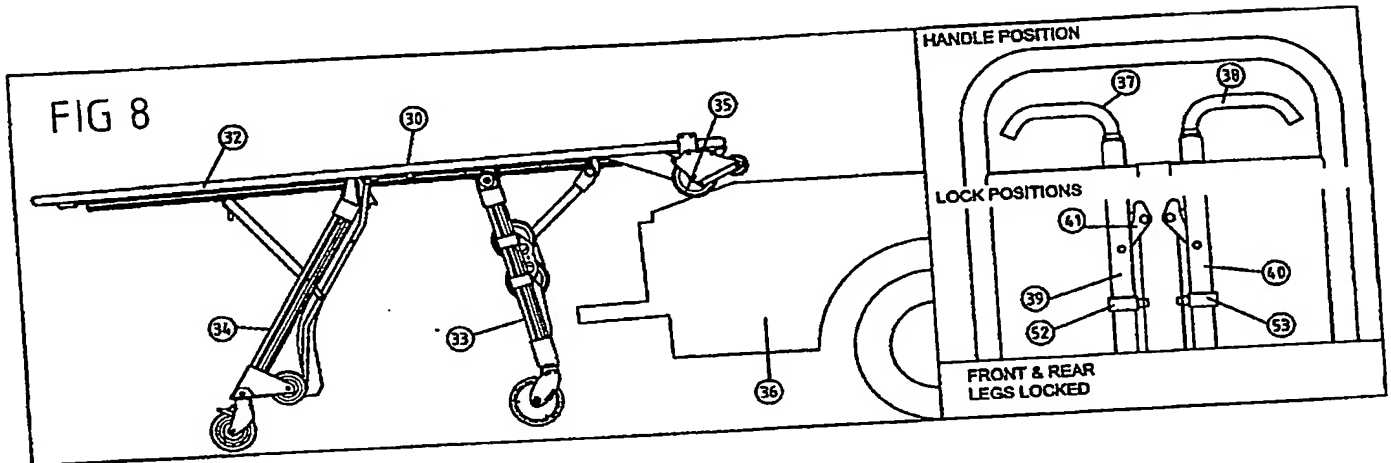
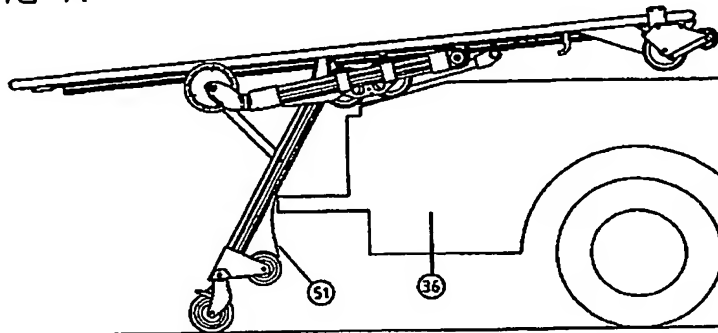
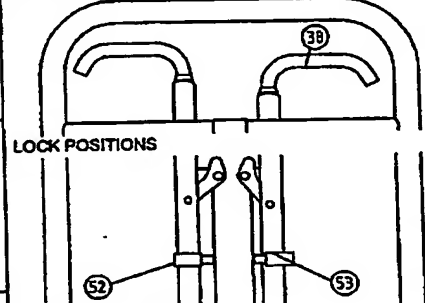


FIG 11

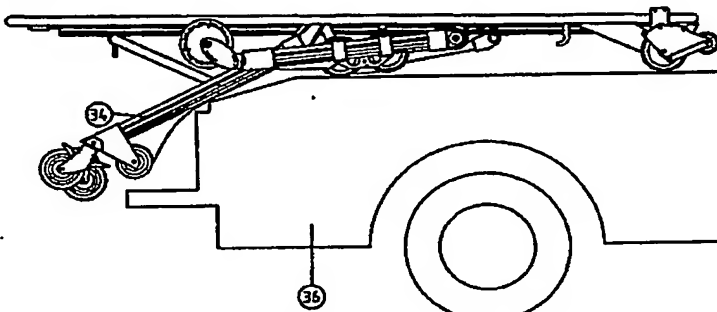


HANDLE POSITION

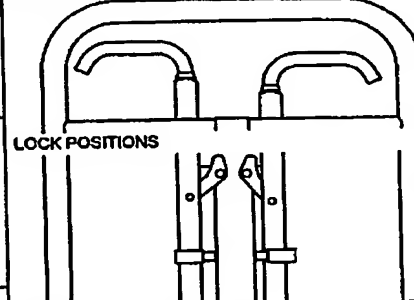


TOUCH BAR PUSHED
IN - UNLOCKS SECOND LOCK ON REAR LEG

FIG 12

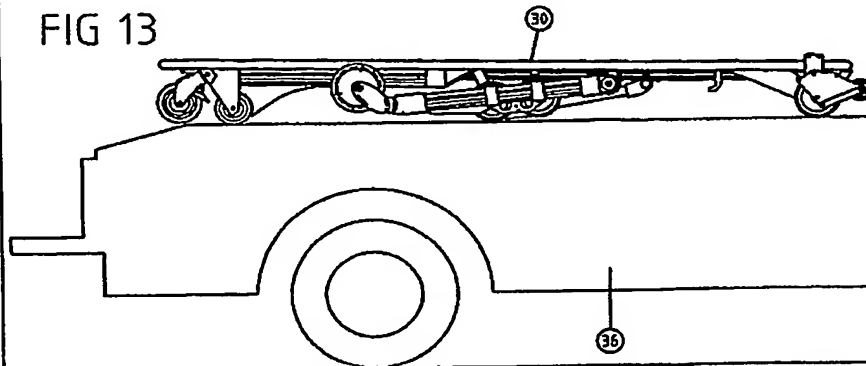


HANDLE POSITION

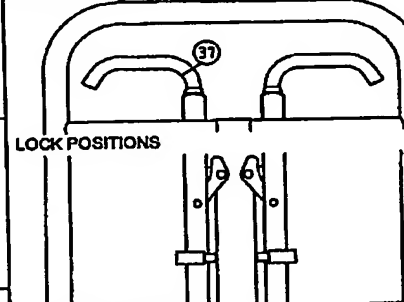


REAR LEGS
UNLOCKED

FIG 13



HANDLE POSITION



HANDLE RELEASED